UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Airborne Electromagnetic and Magnetic Survey of parts of the Upper Peninsula of Michigan and Northern Wisconsin

Conducted and Prepared by Geoterrex Limited

With an Introduction by William D. Heran

U.S. Geological Survey

Open File Report 81-577A

Introduction

The data presented in this report is from an airborne electromagnetic INPUT (Registered trademark of Barringer Research Ltd.) and total field magnetic survey conducted by Geoterrex Limited of Ottawa Canada. The survey is located in eight areas in the Upper Peninsula of Michigan and one area in Northern Wisconsin. The accompanying report describes the basic parameters for the areas surveyed (figure 1). All of the areas except area E (figure 1) are within the Iron River 2^{o} quadrangle. This quadrangle is being studied as part of the U.S. Geological Survey (USGS) CUSMAP (Conterminous United States Mineral Appraisal Program) project. The survey was done in order to provide geophysical information which will aid in the integrated geological assessment of the Iron River 2^{o} quadrangle.

Specific objectives for each of the survey areas are as follows. Areas A-1 through A-5 were flown over the contact between Proterozoic Jacobsville Sandstone and older crystalline basement. The geologic setting is thought to be, in a general sense, favorable for uranium mineralization (Kalliokoski, 1977). In a somewhat analogous geologic setting, uranium mineralization in the Athabasca Basin in Canada is preferentially associated with graphitic units within the crystalline basement (Hoeve and Sibbald, 1978). Because these graphite units are usually good conductors, data from airborne electromagnetic methods may indicate their presence beneath the covering glacial drift and sandstone. Several such conductors are defined by the survey. The INPUT data for this area is being interpreted at Michigan Technical University. The funding for the collection of geophysical data in area A was provided by the Department of Energy as a part of their study of world class uranium deposits.

Area B (Figure 1) comprises part of a gneiss dome complex (Cannon, 1978) that includes meta-volcanic, graphitic, gneiss, iron formation and metasedimentary units. There are known uranium and basemetal occurrences in this area. Funding for the survey was provided through the USGS CUSMAP project.

Area C (figure 1) is a region of structural complexity within the Jacobsville Sandstone that is being studied and funded by the CUSMAP project and the Geology Department at Michigan Technical University at Houghton, Michigan.

Areas D and E (figure 1) are wilderness study areas. Flying in these areas was funded by the USGS Wilderness program.

The airborne electromagnetic data was supplemented by an airborne radiometric survey. Data from this survey is unpublished at present. Other INPUT data for the southeast corner of the Iron river quadrangle has been released by Heran and Smith (1980).

This report is accompanied by the INPUT maps (Plates 1-22) of each of the survey areas, showing locations of fiducial points, the flight lines, locations of anomalies and conductive zones; all plotted on an air photomosaic.

The analog records of the INPUT data in microfische form are available in U.S. Geological Survey Open File Report 81-577B.

Plate 1	Areas A-1 & A-2
Plate 2	Area A-2
Plate 3	Area A-2
Plate 4	Area A-2 & Area D
Plate 5	Area D
Plate 6	Area A-3
Plate 7	Areas A-3 & A-2
Plate 8	Areas A-2 & A3 & Area D
Plate 9	Area D
Plate 10	Area A-4
Plate 11	Area A-3
Plate 12	Area A-3
Plate 13	Area C & Area A-4
Plate 14	Area A-4
Plate 15	Areas A-3 & A-4
Plate 16	Area A-5
Plate 17	Areas A-4 & A-5
Plate 18	Area B & Area A-4
Plate 19	Area B
Plate 20	Area A-5
Plate 21	Area A-5
Plate 22	Area E

Selected References

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Cannon, N. F., 1978, Geologic map of the Iron River 1^{o} x 2^{o} quadrangle, Michigan and Wisconsin: U.S. Geological Survey Open File Report 78-342, scale 1:250,000.

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Report by Geoterrex Ltd., Ottawa Canada*

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